REMARKS

Claims 9-12 and 14 are presently pending in this application.

In the most recent Office Action, the Examiner rejected claim 12 under 35 USC §112, second paragraph, as being indefinite. Applicant has now amended the claim to recite that the sources and drains are formed on the plurality of die. Basis for this amendment may be found in the specification at the sentence bridging pages 5 and 6. Claim 12, as amended, is believed to be in compliance with §112.

Also in the Office Action, the Examiner rejected claim 9 under 35 USC §103 as unpatentable over "applicant's admitted prior art" in view of Henley et al. (US Patent No. 6,083,324) (newly cited). By "applicant's admitted prior art," it is understood that the Examiner is relying on applicant's discussion of the prior art Kaufman ion source implantation technique discussed at page 1, lines 12-22, of the specification. Henley teaches a method of providing a gettering layer in a silicon-on-insulator wafer using an ion implantation technique to implant gas or precipitate-forming particles beneath the surface of a silicon wafer, but above the surface of any underlying insulating layer. See col. 4, lines 34-55. After the wafer is thermally processed, the implanted ions or gases form microbubbles or precipitates which act as gettering sites for impurities in the silicon layer of the wafer. The Examiner has concluded that it would have been obvious to combine the teachings of "applicant's admitted prior art" and Henley's teaching of implanting hydrogen ions to obtain the invention of claim 9. Applicant disagrees.

First, Henley teaches a number of possible ions, gases, and carbon for use as the microbubble or precipitate-forming particles in the gettering layer. One would initially have to have some motivation to pick hydrogen ions from the numerous possible choices. Second, there is no motivation to combine the teachings of the "admitted prior art" with Henley. Henley does not teach or suggest implanting anything in a **silicon dioxide** substrate as claimed. Rather, Henley teaches implanting a variety of ions, gases or carbon ***between*** an insulating layer of silicon oxide and the top surface of the wafer. See col. 4, lines 37-38. Nor does Henley teach or suggest implanting ions or gases in a silicon dioxide substrate for the purpose of providing a subsequent layer of polycrystalline silicon which has a smooth morphology as claimed. Rather, Henley

teaches implanting ions or gases for the purpose of forming microbubbles or precipitates which act as a gettering layer for impurities in the silicon layer.

The Examiner has suggested that one would be motivated to combine the teachings of Henley with the "admitted prior art" because Henley teaches that the use of PIII produces less impurity metal contamination. However, there is nothing in Henley which suggests that the PIII technique could be used to treat a layer of silicon dioxide for the purpose of providing a smoother layer of subsequently deposited polycrystalline silicon. In fact, Henley teaches away from treating the insulating layer by specifically implanting ions and gases above the insulating layer. Finally, Henley's insulating layer and gettering layer are buried. One looking for a surface treatment to prepare an insulating surface layer for a subsequent deposition of polysilicon would not look to Henley for a solution.

As taught in the present invention, the implantation of hydrogen ions in the silicon dioxide substrate is believed to increase the number of nucleation sites for the subsequent polycrystalline silicon deposition, creating a smooth morphology. See the specification at page 10, lines 2-5. Henley et al. do not teach or suggest the use of the PIII technique for this purpose. Claim 9 is clearly patentable over the cited teachings.

The Examiner has rejected claims 10-12 under 35 USC §103 as unpatentable over Burns et al (Principles of Electronic Circuits) in view of "applicant's admitted prior art" taken further with Henley et al. Burns et al. teach a field effect transistor. The Examiner has admitted that Burns et al. do not teach a silicon dioxide layer having hydrogen ions implanted therein or a silicon dioxide layer which is free of sputtered metal contaminants, but asserts that it would have been obvious to combine the cited teachings to obtain the claimed invention in order to "prepare the surface of the silicon dioxide for the deposition of a layer of polycrystalline silicon to provide for a thinner and smoother polycrystalline silicon film."

Again, the Examiner has provided no substantive reasoning as to how or why one skilled in the art would pick the technique of Henley et al. to implant hydrogen ions in a silicon dioxide layer for this purpose. As pointed out above, the teachings of Henley et al. provide no motivation for implanting hydrogen ions in a silicon dioxide layer for any purpose, let alone the specific purpose of providing a smooth morphology for a layer of

polycrystalline silicon formed on the silicon dioxide layer. Nor would one skilled in the art look to Henley to treat the surface of an insulating layer as Henley teach implanting ions or gases above the insulating layer. Claims 10-12 are clearly patentable over the cited teachings.

Claim 14 was rejected under 35 USC §103 as being unpatentable over Murata et al. in view of "applicant's admitted prior art" taken further with Henley et al. The Examiner concedes that Murata et al. do not teach a silicon dioxide substrate having hydrogen ions implanted therein which is free of sputtered metal contaminants, but asserts that "applicant's admitted prior art" teaches implanting hydrogen ions into a silicon dioxide layer to provide a smooth topology polycrystalline silicon film and that Henley et al. teach using a PSII method to implant hydrogen. As pointed out above, there is clearly no motivation to combine the teachings of the references. Henley et al. do not teach or suggest implanting hydrogen ions into a **silicon dioxide layer**, but rather teach implanting ions or gases above the insulating layer. There is nothing in Henley et al. or the other prior art teachings which would motivate one skilled in the art to use a PSII method to implant hydrogen ions into a silicon dioxide layer for the purpose of providing a subsequent polycrystalline silicon layer having a smooth morphology as claimed.

For all of the reasons stated above, applicant submits that claims 9-12 and 14 as amended are in compliance with §112 of the statute and are patentable over the prior art of record. Early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,
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